

REMARKS

Claims 1 and 31 are amended. Claims 32 and 33 are new. No new subject matter is added. Claims 1-11 and 31-33 are pending. Reconsideration and allowance of the pending claims is requested in light of the following remarks.

Allowable Subject Matter

Claims 5-11 are allowed.

In the Claims

Claim 1 is amended to recite that the lower electrode has an overall shape that is substantially flat. This feature is fully supported by the original application at, e.g., FIG. 4, which illustrates a lower electrode 125b having an overall shaped that is substantially flat. Nakajima fails to disclose this feature (see, e.g., FIG. 1, element 24).

Claim 31 is amended to recite that the lower electrode has an overall shape that is substantially flat in cross-section, and that the concave upper electrode has an overall shape that is substantially U-shaped in cross-section. This feature is fully supported by the original application at, e.g., FIG. 4, which illustrates a lower electrode 125b having an overall shape that is substantially flat in cross-section, and a concave upper electrode 141 having an overall shape that is substantially U-shaped in cross-section. Nakajima fails to disclose that the alleged concave upper electrode 26 has an overall shape that is substantially U-shaped in cross-section, or that the alleged lower electrode 24 has an overall shape that is substantially flat in cross-section (FIG. 1).

New claim 32 depends from claim 31, and recites that the concave upper electrode has a lowest horizontal surface that is disposed at a level that is vertically higher than a highest horizontal surface of the lower electrode. This feature is fully supported by the original application at, e.g., FIG. 4, which illustrates that a lowest horizontal surface of the concave upper electrode 141 is disposed at a level that is vertically higher than a highest horizontal surface of the lower electrode 125b. Nakajima fails to disclose these features (see, e.g., FIG. 1).

New claim 33 depends from claim 32, and recites that the lowest horizontal surface is longer than the highest horizontal surface by a predetermined amount, and that the lowest horizontal surface is wider than the highest horizontal surface by the predetermined amount. These features are fully supported by the original application e.g., FIG. 4 and page 5, line 30 to page 6, line 2. Nakajima fails to disclose these features, as Nakajima's cross-sectional

FIG. 1 shows either length and depth only, or width and depth only. Nakajima's cross-sectional FIG. 1 does not illustrate both width and length.

Claim Rejections – 35 U.S.C. § 112

Claim 31 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. It is alleged that the subject matter of lines 4-6 of the claim "was not described in the specification in such a way as to reasonably convey to one of skill[ed] in the relevant art that the inventors(s), at the time the application was filed, had possession of the claimed invention."

In particular, it is alleged that the specification never discloses "a total area of the substantially horizontal surfaces greater than a total area of the substantially vertical surfaces" as claimed in claim 31. This feature is deleted from claim 31, thereby overcoming this rejection.

Claim Rejections – 35 U.S.C. § 102

Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakajima, et al. The applicant disagrees.

Regarding Nakajima's FIG. 1, the examiner does not dispute that element 21 is a polycrystalline silicon plug (column 9, line 25-26), or that element 24 is a cup-shaped lower electrode (column 9, lines 47-49). Despite this clear indication to the contrary from the reference itself, it is alleged that "[S]ince element 21 is also electrically connected to the lower electrode 24, it is considered as a part of the lower electrode." Thus, armed with this interpretation of Nakajima, it is concluded that the length of the bottom part of the concave upper electrode 26 is greater than a length of the lower electrode 21.

The applicant respectfully reminds the examiner that claim 1 also requires that the lower electrode have an overall shape that is substantially flat. Not only does Nakajima's cup-shaped lower electrode 24 fail to have a flat shape, interpreting Nakajima's polycrystalline silicon plug 21 to be part of the cup-shaped lower electrode 24 does not make the overall shape of the so-called lower electrode consisting of the elements 21 and 24 any flatter.

Furthermore, the applicant submits that whatever interpretation the examiner adopts, it should be consistent throughout the claim. Claim 1 recites that the lower electrode is electrically coupled to the lower interconnection. Claim 1 also recites that the first upper interconnection is electrically coupled to the lower interconnection.

Following the same rationale that the examiner uses to justify that Nakajima's polycrystalline silicon plug 21 is part of the cup-shaped lower electrode 24, the polysilicon plug 8a (FIG. 1) should also be considered part of the cup-shaped lower electrode, since these elements are all electrically coupled. Thus, according to the examiner, Nakajima's lower electrode should actually consist of the elements 24, 21 and 8a.

However, if Nakajima's elements 24, 21 and 8a are all considered to be the recited lower electrode, then contrary to claim 1 Nakajima fails to teach that an overall shape of the lower electrode is substantially flat, or that there is a recited lower interconnection disposed below the lower electrode.

If the examiner adopts the interpretation that Nakajima's lower electrode includes all of the elements 24, 21 and 8a, then it is logically unsound to simultaneously adopt the mutually incompatible interpretation that each of the elements 24, 21 and 8a is also independent of the other.

The examiner further suggests that Nakajima FIG. 1 shows a first upper interconnection 12 that is "electrically coupled" to the lower interconnection when the memory transistor is in an on state. Thus, again following the examiner's rationale, the size of Nakajima's lower electrode is dependent upon the operational state of the memory transistor. That is, Nakajima's lower electrode includes the elements 24, 21 and 8a (when the memory transistor is off), or Nakajima's lower electrode includes the elements 24, 21, 8a, 1, 15 and 12 (when the memory transistor is on, all these elements must be electrically coupled in order for element 12 to be electrically coupled to element 8a). This interpretation is of course, ridiculous, but it is the logical outgrowth of the examiner's position that one element is part of another element if they can be electrically connected.

The reasonable (and correct) interpretation of Nakajima is that the extent of the cup-shaped lower electrode 24 is limited to the boundaries shown in FIG. 1, and that the polycrystalline silicon plug 21 is not part of the cup-shaped lower electrode 24 merely because it can be electrically coupled to the cup-shaped lower electrode. Contrary to claim 1, a length of a bottom part of Nakajima's concave upper electrode 26 is not greater than a length of Nakajima's cup-shaped lower electrode 24.

For this reason, Nakajima fails to anticipate claim 1 because it does not show the identical invention in as complete detail as contained in the claim. MPEP 2131.

Claims 2-4 depend from claim 1, and Nakajima fails to anticipate claims 2-4 at least because they depend from claim 1. MPEP 2131.

Conclusion

For the above reasons, reconsideration and allowance of the pending claims is requested. Please telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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